WHAT IS CLAIMED IS:

1. A mixer circuit, comprising:

a mixer core, further comprising:

a first switch having an input switchable between a first output and a second output; and

a second switch having an input switchable between a first output and a second output; and

a mode select circuit coupled to the mixer core, the mode select circuit comprising:

a third switch having an input coupled to second output of the first switch, the input switchable between a first output coupled to the first output of the first switch, and a second output coupled to the second output of the second switch; and

a fourth switch having an input coupled to the first output of the second switch, the input switchable between a first output coupled to the first output of the first switch, and a second output coupled to the second output of the second switch.

2. The mixer circuit of claim 1, wherein the inputs of the first and second switches are configured to receive oppositely polarized signals comprising a differential signal.

3. The mixer circuit of claim 1, wherein one of the first or second switch inputs is configured to receive a single-ended signal, and wherein the other first or second switch input is coupled to an ac ground potential.

4. The mixer circuit of claim 1, wherein the inputs of the first and second switches are configured to receive a differential input signal operating at a first frequency, wherein the first and second switches are configured to switch their respective inputs between their two outputs at a second frequency, and wherein, responsive to the selected output of the third and fourth switches, the first output of the first switch, and the second output of the second switch are configured to output a signal which is either (i) at the first frequency, or (ii) a mixing product of the first frequency and the second frequency.

5. The mixer circuit of claim 1, further comprising an oscillator coupled to the first and second switches, the oscillator outputting a signal at the second frequency which operates to switch, at the second frequency, each of the inputs of the first and second switches between their respective first and second outputs.

6. The mixer circuit of claim 1, further comprising at least one IF load coupled to the first output of the first switch and the second output of the second switch.

7. The mixer circuit of claim 6, wherein the at least one IF load comprises one IF load coupled between the first output of the first switch and the second output of the second switch.

8. The mixer circuit of claim 6, wherein at least one IF load comprises a first IF load coupled between the first output of the first switch and an ac ground, and a second IF load coupled between the second output of the second switch and an ac ground.

9. The mixer circuit of claim 6, wherein each of the first and second switches is operable to switch between its first and second output at a predefined frequency.

10. The mixer circuit of claim 9, wherein: (i) the input of each of the first and second switches are operable to continue switching between their respective first and second outputs at the predefined frequency, and (ii) the at least one IF load is operable to maintain its coupling to the first output of the first switch and the second output of the second switch, regardless of the output selected for the third and fourth switches.

11. The mixer circuit of claim 1, wherein each of the first, second, third and fourth switches comprise bipolar junction transistors, field effect transistors, or diodes.

12. The mixer of claim 1, wherein each of the first, second, third, and fourth switches comprises a differential transistor pair.

13. The mixer circuit of claim 12, wherein:

the first switch comprises a first differential pair having first and second base terminals, commonly-connected emitter terminals, and first and second collector terminals;

the second switch comprises a second differential pair having a first base terminal coupled to the second base terminal of the first differential pair, a second base terminal coupled to the first base terminal of the first differential pair, commonly-connected emitter terminals, and first and second collector terminals;

the third switch comprises a third differential pair having first and second base terminals, commonly-connected emitter terminals coupled to the second collector terminal of the first differential pair, a first collector terminal coupled to the first collector terminal of the first differential pair, and a second collector terminal coupled to the second collector terminal of the second differential pair; and

the fourth switch comprises a fourth differential pair having a first base terminal coupled to the second base terminal of the third differential pair, a second base terminal coupled to the first base terminal of the third differential pair, commonly-connected emitter terminals coupled to first collector terminal of the second differential pair, a first collector terminal coupled to the first collector terminal of the first differential pair, and a second collector terminal coupled to the second collector terminal of the second differential pair.

14. The mixer circuit of claim 13, wherein the first switch further comprises a first buffer transistor having a collector terminal coupled to the commonly-connected emitter terminals of the first differential pair, an emitter terminal, and a base terminal comprising the input of the first switch, wherein the second switch further comprises a second buffer transistor having a collector terminal coupled to the commonly-connected emitter terminals of the second differential pair, an emitter terminal, and a base terminal comprising the input of the second switch, the mixer circuit further comprising at least one resistor coupled between the emitter terminals of the first and second buffer transistors.

15. The mixer circuit of claim 13, further comprising an oscillator coupled to the base terminals of the first and second differential pairs, the oscillator operable to supply a signal operating at the second frequency to the first and second differential pairs during both the bypass and mixing modes of operation.

16. The mixer circuit of claim 13, further comprising:

a first IF load coupled between the first collector terminal of the first differential pair and an ac ground; and

a second IF load coupled between the second collector terminal of the second differential pair and an ac ground.

17. The mixer of claim 13, further comprising an IF load coupled between first collector terminal of the first differential pair and the second collector terminal of the second differential pair.

18. A mixer circuit configured to operate in a bypass or mixing mode, the mixer circuit comprising:

a mixer core, which comprises:

a first switch having an input, a first output, and a second output; and

a second switch having an input, a first output, and a second output; and

a mode select circuit coupled to the mixer core, the mode select circuit comprising:

first switching means for coupling the first and second outputs of the first switch to either (i) a common node or (ii) opposite polarity nodes; and

second switching means for coupling the first and second outputs of the second switch to either (i) a common node or (ii) opposite polarity nodes.

19. The mixer circuit of claim 18, wherein the first switching means comprises a third switch having an input coupled to second output of the first switch, the input switchable between a first output coupled to the first output of the first switch, a second output coupled to the second output of the second switch.

20. The mixer circuit of claim 19, wherein the second switching means comprises a fourth switch having an input coupled to the first output of the second switch, the input switchable between a first output coupled to the first output of the first switch, and a second output coupled to the second output of the second switch.

21. The mixer of claim 20, further comprising an oscillator coupled to the first and second switches, the oscillator outputting a signal at the second frequency which operates to switch, at the second frequency, each of the inputs of the first and second switches between their respective first and second outputs.

22. The mixer circuit of claim 18, further comprising at least one IF load coupled to the first output of the first switch and the second output of the second switch.

23. The mixer circuit of claim 22, wherein the at least one IF load comprises one IF load coupled between the first output of the first switch and the second output of the second switch.

24. The mixer circuit of claim 22, wherein at least one IF load comprises a first IF load coupled between the first output of the first switch and an ac ground, and a second IF load coupled between the second output of the second switch and an ac ground.

25. The mixer circuit of claim 22, wherein each of the first and second switches is operable to switch between its first and second output at a predefined frequency.

26. The mixer circuit of claim 25, wherein: (i) the input of each of the first and second switches are operable to continue switching between their respective first and second outputs at the predefined frequency, and (ii) the at least one IF load is operable to maintain its coupling to the first output of the first switch and the second output of the second switch, regardless of whether the first and second switching means operate to switch their respective first and second outputs to either a common node or opposite polarity nodes.

27. A mixer circuit configured to operate in a bypass mode or in a mixing mode, the mixer circuit comprising:

a mode select switch having an input configured to receive a first signal operating at a first frequency, the input switchable between a first output and a second output;

a bypass circuit having an input port coupled to the first output of the mode select switch, and a load port, the bypass circuit configured to pass the first signal therethrough; and

a mixer core having a first input port coupled to the second output of the mode select switch, a second input port configured to receive a second signal operating at a second frequency, and a load port;

wherein, when the input of the mode select switch is coupled to the bypass circuit, the first signal is supplied to the load port, and when the input of the mode select switch is coupled to the mixer core, the first signal is supplied to the mixer core, thereby producing a third signal operating at a frequency defined by a mixing product of the first and second frequencies.

28. The mixer circuit of claim 27, further comprising a common load coupled to the load ports of the bypass circuit and mixer core, wherein when the mode select switch is coupled to the bypass circuit, the first signal is output to the common load, and when the mode select switch is coupled to the mixer core, the third signal is output to the common load

29. The mixer circuit of claim 27, wherein the mixer core comprises a balanced mixer.

30. The mixer circuit of claim 29, wherein the mixer core comprises a doubly balanced mixer.

31. A common oscillator, multiple mixer system, comprising:

an oscillator configured to output a reference signal operating at an reference frequency; and

a plurality of mixer circuits, each mixer circuit coupled to receive the reference signal and each mixer circuit comprising:

a mixer core, further comprising:

a first switch having an input switchable between a first output and a second output; and

a second switch having an input switchable between a first output and a second output; and

a mode select circuit coupled to the mixer core, the mode select circuit comprising:

a third switch having an input coupled to second output of the first switch, the input switchable between a first output coupled to the first output of the first switch, and a second output coupled to the second output of the second switch; and

a fourth switch having an input coupled to the first output of the second switch, the input switchable between a first output coupled to the first output of the first switch, and a second output coupled to the second output of the second switch.

32. The common oscillator, multiple mixer system, of claim 31, wherein the inputs of the first and second switches are configured to receive oppositely polarized signals comprising a differential signal.

33. The common oscillator, multiple mixer system of claim 31, wherein one of the first or second switch inputs is configured to receive a single-ended signal, and wherein the other first or second switch input is coupled to an ac ground potential.

34. The common oscillator, multiple mixer system of claim 31, wherein the inputs of the first and second switches are configured to receive a differential input signal operating at a respective input frequency and, wherein the first and second switches of each mixer circuit are configured to receive the reference signal and, in response, switch between their respective first and second outputs at the reference frequency, and wherein, responsive to the selected output of the third and fourth switches, the first output of the first switch, and the second output of the second switch of each mixer circuit are configured to output a signal which is either (i) at the respective input frequency, or (ii) a mixing product of the respective input frequency and the reference frequency.

35. The mixer circuit of claim 31, further comprising an oscillator coupled to the first and second switches, the oscillator outputting a signal at the reference frequency which operates

to switch, at the reference frequency, each of the inputs of the first and second switches between their respective first and second outputs.

36. The mixer circuit of claim 31, further comprising at least one IF load coupled to the first output of the first switch and the second output of the second switch.

37. The mixer circuit of claim 36, wherein the at least one IF load comprises one IF load coupled between the first output of the first switch and the second output of the second switch.

38. The mixer circuit of claim 36, wherein at least one IF load comprises a first IF load coupled between the first output of the first switch and an ac ground, and a second IF load coupled between the second output of the second switch and an ac ground.

39. The mixer circuit of claim 36, wherein each of the first and second switches is operable to switch between its first and second output at the reference frequency.

40. The mixer circuit of claim 39, wherein: (i) the input of each of the first and second switches are operable to continue switching between their respective first and second outputs at the reference frequency, and (ii) the at least one IF load is operable to maintain its coupling to the first output of the first switch and the second output of the second switch, regardless of the output selected for the third and fourth switches.

41 A common oscillator, multiple mixer system, comprising:

an oscillator configured to output a reference signal operating at an reference frequency; and

a plurality of mixer circuits, each mixer circuit coupled to receive the reference signal and each mixer circuit comprising:

a mode select switch having an input configured to receive a respective input signal operating at a respective input frequency, the input switchable between a first output and a second output;

a bypass circuit having an input port coupled to the first output of the mode select switch, and a load port, the bypass circuit configured to pass the first signal therethrough; and

a mixer core having a first input port coupled to the second output of the mode select switch, a second input port configured to receive the reference signal operating at the reference frequency, and a load port;

wherein, when the input of the mode select switch is coupled to the bypass circuit, the respective input signal is supplied to the load port, and when the input of the mode select switch is coupled to the mixer core, the respective input signal is supplied to the mixer core, thereby producing a third signal operating at a frequency defined by a mixing product of the respective input and reference frequencies.

42. The common oscillator, multiple mixer system of claim 41, wherein each mixer circuit further comprises a common load coupled to the load ports of the bypass circuit and mixer core, wherein when the mode select switch is coupled to the bypass circuit, the respective input signal is output to the common load, and when the mode select switch is coupled to the mixer core, the third signal is output to the common load.

43. The common oscillator, multiple mixer system of claim 42, wherein one or more of the mixer cores comprises a balanced mixer.

44. In a system which receives a first signal operating at a first frequency, a method for selectively outputting either the first signal operating at the first frequency, or a signal operating at a frequency defined by the mixing product of the first frequency and a second frequency, the method comprising:

supplying the first signal to at least one of two input switches, wherein each of the two input switches has an input switchable to either a first output or a second output;

for each of the first and second switches, switching the input terminal between the first and second outputs at a second frequency; and

connecting the first and second outputs of each of the first and second switches to either (i) a common node to output a signal at the first frequency, or (ii) opposite polarity

nodes to output a signal at a frequency defined by a mixing product of the first and second frequencies.

45. The method of claim 44, wherein supplying the first signal comprises supplying a positive polarity of the first signal to the input terminal of the first switch, and supplying a negative polarity of the first signal to the input terminal of the second switch.

46. The method of claim 44, wherein supplying the first signal comprises supplying a single-ended signal to the input of one of the input switches, and ac grounding the input of the other input switch.

47. The method of claim 44, wherein the first output of the first switch and the second output of the second switch are coupled to at least one IF load and switching the input terminal of each of the first and second switches comprises continuously switching the input terminals of the first and second switches between their respective first and second output terminals at the second frequency regardless of the output selected for the third and fourth switches.